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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,349	01/30/2004	Jun Shimojo	SANK.0005	5226

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EXAMINER
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QUASH, ANTHONY G

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/767,349

Applicant(s)

SHIMOJO ET AL.

Examiner

Anthony Quash

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 19-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 4/30/04.
- 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

In a response filed, 11/23/05, applicants elected claims 1-18 without traverse.  
Claims 19-27 are thereby withdrawn.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It unclear from the claim exactly what containment structure employed to shield the accommodating portion form the outside of the cask that the applicants are referring to in the claim and drawings. Clarity is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8,12 are rejected to the extent understood under 35 U.S.C. 103(a) as being unpatentable over Rollins [3,886,368] in view of Akamatsu [5,887,042]. As per

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claim 1, 10, Rollins [3,886,368] teaches a inner shell (10) made of metal, and outer shell (12) made of metal a shielding body between the inner shell and the outer shell, heat transfer fins provided between the inner shell and the outer shell, and an accommodation portion formed inside the inner shell for accommodating radioactive substances, a containment structure being employed to shield the accommodation portion from the outside of the cask, and the heat transfer fins each having an inner shell side and an outer shell side and being configured such that the inner shell side is in contact with the inner shell and the outer shell side if formed with at least a portion that is not in contact with the outer shell. See Rollins [3,886,368] abstract, figs. 4, 6, 10, col. 1 lines 20-40, col. 2 lines 30-67, col. 3 lines 20-35, col. 4 lines 15-25, and col. 6 lines 10-20. However, Rollins [3,886,368] does not explicitly state there concrete be used to fill the region between the inner and outer shells. Akamatsu [5,887,042] does teach concrete being used to fill the region between the inner and outer shells. See Akamatsu [5,887,042] col. 3 lines 45-65. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use concrete to fill the region between the inner and outer shells in order to provide additional neutron shielding.

As per claim 2, Rollins [3,886,368] teaches at least a first heat transfer fin provided in contact with the outer shell and a second heat transfer fin provided in contact with the inner shell, the first heat transfer fin and the second heat transfer fin being provided so as to overlap each other and so that there is clearance between the first and second heat transfer fins in the overlap portion. See Rollins [3,886,368] fig. 6.

As per claim 3, Rollins [3,886,368] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating when the length of the overlap portion of the first and second heat transfer fins is denoted by  $w_1$  and the clearance between the first and second heat transfer fins in the overlap portion is denoted by  $a_1$ , then the following relation is satisfied,  $a_1 \leq (2 \cdot \lambda_c \cdot w_1 \cdot L_c) / (\lambda_f \cdot t)$ . The equation is not considered patentable since it would have been obvious to one of ordinary skill in the art at the time the invention was made to derive the length of the overlap portion in order to determine the amount of and rate at which heat is dissipated through the material and off of the fin.

As per claim 4, Akamatsu [5,887,042] teaches that it was known to form fins into L shapes. See Akamatsu [5,887,042] col. 1 lines 40-50. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the heat transfer fins that form the separation portion be formed to have substantially an L-like shape so to be provided with an opposite surface facing the inner shell or the outer shell and also to increase the surface area by which the heat can be dissipated into the material.

As per claim 5, Rollins [3,886,368] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating when the length of the overlap portion of the first and second heat transfer fins is denoted by  $w_1$  and the clearance between the first and second heat transfer fins in the overlap portion is denoted by  $a_1$ , then the following relation is satisfied,  $a_2 \leq (2 \cdot \lambda_c \cdot w_2 \cdot L_c) / (\lambda_f \cdot t)$ . The equation is not considered patentable since it would have been obvious to one of ordinary skill in the art at the time

the invention was made to derive the length of the overlap portion in order to determine the amount of and rate at which heat is dissipated through the material and off of the fin.

As per claim 6, Akamatsu [5,887,042] teaches the fins formed to have an I-like shape, when viewed from the shell end. See Akamatsu [5,887,042] fig. 5.

As per claim 7, Rollins [3,886,368] teaches the separation portion being composed so as to separate completely the heat transfer fins and the inner shell or outer shell. See Rollins [3,886,368] figs. 6,10.

As per claim 8, Rollins [3,886,368] teaches the heat transfer fins being disposed at an angle to the radial direction of the shielding body. See Rollins [3,886,368] figs. 6,10.

As per claim 12, Akamatsu [5,887,042] teaches the shield body comprises a metal material in at least one shape of grains, particles or fibers. See Akamatsu [5,887,042] col. 3 lines 50-56.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rollins [3,886,368] in view of Akamatsu [5,887,042] as applied to claim 1 above, and further in view of Lusk [3,005,105]. As per claim 9, Rollins [3,886,368] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating that openings being formed in the heat transfer fins. Lusk [3,005,105] does teach openings be formed in the heat transfer fins. See Lusk [3,005,105] figs. 4,6, col. 3 lines 35-45. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have holes formed in the fins in order to ensure greater contact for heat transfer purposes as taught in Lusk [3,005,105].

Claims 14,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rollins [3,886,368] in view of Akamatsu [5,887,042] as applied to claim 1 above, and further in view of Kamoshida [2003/0102445]. As per claim 14, Rollins [3,886,368] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating the shielding body contain 15 mass % or more hydroxide retaining water as crystals with a melting point and decomposition temperature higher than 100 degrees Celsius. Kamoshida [2003/0102445] does teach the shielding body comprising hydroxide. See Kamoshida [2003/0102445] abstract, paragraphs [0005-0006]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the shielding body contain 15 mass % or more hydroxide retaining water as crystals with a melting point and decomposition temperature higher than 100 degrees Celsius in order to reduce the possibility of flame ignition, since hydroxide is flame resistant.

As per claim 17, Akamatsu [5,887,042] teaches the shielding body being sealed so as to be shielded from outside air. See Akamatsu [5,887,042] col. 6 lines 50-55.

Claims 10-11,13 are rejected to the extent understood under 35 U.S.C. 103(a) as being unpatentable over Lusk [3,005,105] in view of Akamatsu [5,887,042]. As per claim 10, Lusk [3,005,105] teaches an inner shell and outer shell made from metal, a shielding body composed between the inner and outer shells, an accommodation portion inside the inner shell, a containment structure being employed to shield the accommodation portion from the outside of the cask, and the shielding body composed of metal. See Lusk [3,005,105] figs. 1-6, col. 2 lines 1-16,40-col. 3 lines 55, and col. 4

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lines 5-15. However, it does not explicitly state the material between the shells being concrete. Akamatsu [5,887,042] does teach concrete being used to fill the region between the inner and outer shells. See Akamatsu [5,887,042] col. 3 lines 45-65. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use concrete to fill the region between the inner and outer shells in order to provide additional neutron shielding. With respect to the applicants' claim concerning the material between the shells being comprised of metals with a high thermal conductivity, it is the examiner's view that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the material between the shells being comprised of metals with a high thermal conductivity in order to increase the rate at which heat dissipated from the sample.

As per claim 11, Lusk [3,005,105] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating the thermal conductivity of the shielding body be  $4(\text{W/m}^{\circ}\text{K})$  or more. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a material with a the thermal conductivity of  $4(\text{W/m}^{\circ}\text{K})$  or more, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 13, Akamatsu [5,887,042] teaches the shield body comprises a metal material in at least one shape of grains, particles or fibers. See Akamatsu [5,887,042] col. 3 lines 50-56.



Claims 15-16,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lusk [3,005,105] in view of Akamatsu [5,887,042] as applied to claim 10 above, and further in view of Kamoshida [2003/0102445]. As per claim 15, Lusk [3,005,105] in view of Akamatsu [5,887,042] teach all aspects of the claim except for explicitly stating the shielding body contain 15 mass % or more hydroxide retaining water as crystals with a melting point and decomposition temperature higher than 100 degrees Celsius. Kamoshida [2003/0102445] does teach the shielding body comprising hydroxide. See Kamoshida [2003/0102445] abstract, paragraphs [0005-0006]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the shielding body contain 15 mass % or more hydroxide retaining water as crystals with a melting point and decomposition temperature higher than 100 degrees Celsius in order to reduce the possibility of flame ignition, since hydroxide is flame resistant.

As per claim 16, Lusk [3,005,105] in view of Akamatsu [5,887,042] and further in view of Kamoshida [2003/0102445] all aspects of the claim except for explicitly stating that the hydroxide shows poor solubility or insolubility in water. This aspect is not patentable since it is a property of the material.

As per claim 18, Akamatsu [5,887,042] teaches the shielding body being sealed so as to be shielded from outside air. See Akamatsu [5,887,042] col. 6 lines 50-55.

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**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents Nos. 5,641,970 to Taniuchi et al and 3,113,215 to Allen are considered pertinent to the applicants' disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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